rotated upward or pulled upward) from the ratchet portion **144** by a mechanism (not shown) such as an electronic solenoid or a SMM wire.

[0073] The shape memory material actuator assembly **110** can automatically mechanically activate the shape memory material components sequentially to eliminate control logic and therefore reduce the cost. To realize this, the proximal ends of the shape memory material components **124**, **126** and **128** at the anchor member **120** are all connected to the negative pole of the electric current supply, such as a battery (supply not shown) and the positive pole of the electric current supply is connected to separate electrical contact strips **146**A, **146**B and **146**C each located on the base member **122** between movable members (see FIG. **11**). The bottom of each movable member **112**, **114** and **116** has its own specific electrical contact strip running fore and aft (in the same direction that the movable members **112**, **114** and **116** move) that is aligned with a specific electrical contact strip on the base member **122**. For example, referring to FIG. **11**, movable member **112** has electrical contact strip **148**A (shown with dashed lines) on a bottom surface thereof that is aligned with electrical contact strip **146**A (also referred to herein as a first shape memory material activation mechanism) on the base member **122**. Movable member **114** has an electrical contact strip **148**B on a bottom surface thereof that is aligned with electrical contact strip **146**B (also referred to herein as a second shape memory material activation mechanism) on the base member **122**. Movable member **116** has an electrical contact strip **148**C (shown with dashed lines) on a bottom surface thereof that is aligned with electrical contact strip **146**C on the base member **122**. The shape memory material component connected to each distal movable member always maintains electrical contact with the electrical contact strip on the bottom of the movable member it is attached to. When a switch (not shown) is turned on to allow power flow from the electric current supply, shape memory material component **128** will be in a closed circuit (the circuit including the electrical contact strip **148**A, the electrical contact strip **146**A, the shape memory material component **128** and the power leads) causing shape memory material component **128** to contract and move movable member **112** toward movable member **114**. After movable members **112** and **114** lock together, further movement of movable member **112** will cause electrical contact strip **148**A to be out of contact with electrical contact strip **146**A on the base member **122** and will cause the electrical contact strip **148**B at the bottom of movable member **114** to be in contact with electrical contact strip **146**B on the base member **122**. At this point, shape memory material component **128** is in open circuit and shape memory material component **126** is in closed circuit. Thus, an activation input to the second movable member, i.e., power from the electric current supply attached to the power leads, activates the shape memory material component **126** to move the movable member **114** (and movable member **112** locked thereto). This "automatic activation" of the next shape memory material component via movement of the previous movable member will be repeated until the movable member **116** reaches fixed member **118**. By using a contact switch on movable member **118**, the power can be turned off.

[0074] By locking each locking mechanism as each respective shape memory material component **128**, **126**, and **124** contracts, the load operatively attached to the first movable member or the first movable member itself has a travel distance equaling the sum of the respective gaps (i.e., the open space along base member **122**) between movable members **112** and **114**, between movable members **114** and **116** and between movable member **116** and fixed member **118**. To return the load back toward the distal end of base member **122**, the holding mechanism is first released (i.e., sliding member **138** is moved) if it was utilized, and the latch **130**C is released from the locking pin **132**C. As the shape memory material component **124** is cooled and applies less resistance to stretching, the force of the returning mechanism also referred to as the load (e.g., a dead weight, a constant spring, a linear spring, a strut) is able to pull all the movable members **112**, **114** and **116** toward the distal end of the base member **122**. When movable member **116** is closer to its designed pre-contraction position, the latching between latch **130**B and locking pin **132**B is released by ramped key **136**B and therefore movable member **116** can be detached from movable members **112** and **114**. Similarly, movable member **114** will detach from movable member **112** and stop at the designed pre-contraction location due to the ramped key **136**A.

[0075] Large displacement can be achieved by the shape memory material actuator assembly **110**, as many movable members can be added. The surface area between the movable members and the base member **122** (on which the movable members slide, roll or roll and slide) can be minimized to reduce friction losses. Finally, the returning force of the load can be matched very easily by a load holding force profile as the size or number of shape memory material components, the composition and/or the transformation temperatures can be different for different movable members. Therefore, any returning mechanism such as strut, dead weight, linear spring, constant spring etc. can be chosen for convenience and performance. To have proper fatigue life and for safety and reliability, it is important that the shape memory material components are not over-stretched by the returning mechanism.

[0076] In the embodiment shown in FIG. **12**, all of the movable members **112**, **114** and **116**, and the fixed member **118** have same sized components (the body of movable member or fixed member, the latches **130**A-**130**C, the setscrew at the top of each movable member **112**, **114**, **116** and fixed member **118** to adjust the tension of springs **134**A-**134**C) as shown in movable members **112**, **114** and **116**, as well as components of varying dimension (locking pin **132**A and ramped key **136**A) as shown in and discussed with respect to FIG. **13**.

[0077] FIG. **13** shows movable member **112** locked to movable member **114** which is locked to movable member **116**. Key **136**B acts as a power off holding mechanism as it is raised by bump **140** to interfere with pin **132**B. FIG. **13** illustrates the positioning just prior to automatic activation of shape memory material component **124** (not shown in this cross-section) to move moveable member **116** to lock to fixed member **118**.

[0078] In yet another embodiment, window blinds can be deployed or retracted using shape memory materials. Interfering slats, e.g., greater than or equal to about 2 slats that, in the closed position, cover the desired area, e.g., by overlapping an adjacent slat. In this embodiment, a small movement of the slats (e.g., parallel strips, bars, or so forth) can change a percentage of coverage by the slats (e.g., the slats move to a closed position, FIG. **14**; to an open position FIG. **15**, or anywhere therebetween). The amount of opening attained by the slats is determined by the width of a bar/strip and the overall pitch. For example, if full closure is desired, then two